

AMENDMENTS TO THE CLAIMS:

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

LISTING OF CLAIMS:

1. (Currently amended) An isolatedA polypeptide neoculin acidic subunit (NAS)~~NAS~~ shown below in (A) or (B):
 - (A) a polypeptide comprising the~~a~~n amino acid sequence shown in SEQ ID NO:2~~SEQ ID NO.2~~ in the sequence listing;
 - (B) a polypeptide comprising the~~a~~n amino acid sequence with the substitution, deletion, insertion, addition or inversion of one to five~~or several~~ amino acids in the amino acid sequence shown in SEQ ID NO:2~~SEQ ID NO.2~~ in the sequence listing, which polypeptide can form the neoculin dimer having a taste modifying activity together with a polypeptide NBS shown below in (a) or (b):
 - (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6~~in the sequence listing~~;
 - (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6~~in the sequence listing, which polypeptide can be a subunit constituting curculin.~~
2. (Currently amended) An isolatedA polypeptide NAS according to claim 1, which is glycosylated with an N-linked sugar chain comprising mannose/N-acetylglucosamine/fucose/xylose at a ratio of 3/2/1/1.

3. (Withdrawn) DNA of a gene encoding a polypeptide NAS shown below in (A) or (B):

(A) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.2 in the sequence listing;

(B) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.2 in the sequence listing, which polypeptide can form the neoculin dimer having a taste-modifying activity together with a polypeptide NBS shown below in (a) or (b):

(a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;

(b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.

4. (Withdrawn) DNA of a gene according to claim 3, which is a DNA shown below in (A) or (B):

(A) DNA containing the nucleotide sequence comprising the nucleotides 70 to 408 in the nucleotide sequence shown in SEQ ID NO.1 in the sequence listing;

(B) DNA hybridizing with the DNA of a nucleotide sequence comprising the nucleotides 70 to 408 in the nucleotide sequence shown in SEQ ID NO.1 in the sequence listing or with the DNA of a nucleotide sequence capable of functioning as a probe prepared from at least a part of the nucleotide sequence under stringent

conditions and encoding a polypeptide capable of forming the neoculin dimer having a taste-modifying activity together with a polypeptide NBS shown below in (a) or (b):

- (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;
- (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.

5. (Currently amended) An isolatedA polypeptide neoculin acidic subunit precursor (PNAS)~~PNAS~~ shown below in (A) or (B):

- (A) a polypeptide comprising ~~the~~~~an~~ amino acid sequence shown in SEQ ID NO:3~~SEQ ID NO.3~~ in the sequence listing;
 - (B) a polypeptide comprising ~~the~~~~an~~ amino acid sequence with the substitution, deletion, insertion, addition or inversion of one to five~~or several~~ amino acids in the amino acid sequence shown in SEQ ID NO:3~~SEQ ID NO.3~~ in the sequence listing, ~~which polypeptide grows to the mature polypeptide NAS via processing so as to be able to form the neoculin dimer having a taste modifying activity together with a polypeptide NBS shown below in (a) or (b):~~
- (a) ~~a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;~~
 - (b) ~~a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid~~

~~sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.~~

6. (Currently amended) An isolatedA polypeptide PNAS according to claim 5, which is glycosylated with an N-linked sugar chain comprising mannose/N-acetylglucosamine/fucose/xylose at a ratio of 3/2/1/1.

7. (Withdrawn) DNA of a gene encoding a polypeptide PNAS shown below in (A) or (B):

(A) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.3 in the sequence listing;

(B) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.3 in the sequence listing, which polypeptide grows to the mature polypeptide NAS via processing so as to be able to form the neoculin dimer having a taste-modifying activity together with a polypeptide NBS shown below in (a) or (b):

(a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;

(b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.

8. (Withdrawn) DNA of a gene according to claim 7, which is a DNA shown below in (A) or (B):

- (A) DNA containing a nucleotide sequence comprising the nucleotides 4 to 477 in the nucleotide sequence shown in SEQ ID NO. 1 in the sequence listing;
- (B) DNA hybridizing with the DNA of the nucleotide sequence comprising the nucleotides 4 to 477 in the nucleotide sequence shown in SEQ ID NO.1 in the sequence listing or with the DNA of a nucleotide sequence capable of functioning as a probe prepared from at least a part of the nucleotide sequence under stringent conditions and encoding a polypeptide growing to the mature polypeptide NAS via processing so as to be able to form the neoculin dimer having a taste-modifying activity together with a polypeptide NBS shown below in (a) or (b):
- (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;
- (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.

9. (Withdrawn) A dimeric protein neoculin comprising a polypeptide NAS according to claim 1 and a polypeptide NBS shown below in (a) or (b) and having a taste-modifying activity:

- (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;

(b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.

10. (Withdrawn) A taste-modifying composition containing the dimeric protein neoculin according to claim 9 as the active ingredient.

11. (Withdrawn) A recombinant vector carrying a nucleotide sequence constituting the DNA according to claim 3.

12. (Withdrawn) A recombinant vector carrying a nucleotide sequence constituting the DNA of the gene encoding a polypeptide NBS shown below in (a) or (b):

(a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;

(b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.

13. (Withdrawn) A recombinant vector according to claim 11, which is a vector functioning in eukaryotic organisms.

14. (Withdrawn) A recombinant vector according to claim 12, which is a vector functioning in eukaryotic organisms.
15. (Withdrawn) A recombinant vector according to claim 11, which is a vector functioning in filamentous fungi.
16. (Withdrawn) A recombinant vector according to claim 12, which is a vector functioning in filamentous fungi.
17. (Withdrawn) A recombinant vector according to claim 11, which is a vector functioning in koji molds.
18. (Withdrawn) A recombinant vector according to claim 12, which is a vector functioning in koji molds.
19. (Withdrawn) A transformant carrying a first recombinant vector according to claim 11 and a second recombinant vector carrying a nucleotide sequence constituting the DNA of the gene encoding a polypeptide NBS shown below in (a) or (b):
 - (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;
 - (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid

sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.

20. (Withdrawn) A method for producing a dimeric protein neoculin comprising:

(i) a polypeptide NAS shown below in (A) or (B):

(A) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.2 in the sequence listing;

(B) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.2 in the sequence listing, which polypeptide can form the neoculin dimer having a taste-modifying activity together with a polypeptide NBS shown below in (a) or (b):

(a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;

(b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin; and

(ii) a polypeptide NBS shown below in (a) or (b), and having a taste-modifying activity:

(a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;

(b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid

sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin ,

including a step of culturing a transformant according to claim 19.

21. (Withdrawn) A dimeric protein neoculin comprising a polypeptide NAS according to claim 2 and a polypeptide NBS shown below in (a) or (b) and having a taste-modifying activity:

(a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;

(b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.

22. (Withdrawn) A recombinant vector carrying a nucleotide sequence constituting the DNA according to claim 4.

23. (Withdrawn) A recombinant vector carrying a nucleotide sequence constituting the DNA according to claim 7.

24. (Withdrawn) A recombinant vector carrying a nucleotide sequence constituting the DNA according to claim 8.

25. (Withdrawn) A transformant carrying a first recombinant vector according to claim 11 and a second recombinant vector carrying a nucleotide sequence constituting the DNA of the gene encoding a polypeptide NBS shown below in (a) or (b):

- (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;
- (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin,

wherein the first and second recombinant vectors are vectors functioning in eukaryotic organisms.

26. (Withdrawn) A method for producing a dimeric protein neoculin comprising:

- (i) a polypeptide NAS shown below in (A) or (B):
 - (A) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.2 in the sequence listing;
 - (B) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.2 in the sequence listing, which polypeptide can form the neoculin dimer having a taste-modifying activity together with a polypeptide NBS shown below in (a) or (b):
 - (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;

- (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin; according to claim 25 and
- (ii) a polypeptide NBS shown below in (a) or (b), and having a taste-modifying activity:
- (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;
- (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin ,
including a step of culturing a transformant according to claim 25.

27. (Withdrawn) A transformant carrying a first recombinant vector according to claim 11 and a second recombinant vector carrying a nucleotide sequence constituting the DNA of the gene encoding a polypeptide NBS shown below in (a) or (b):
- (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;
- (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin,

wherein the first and second recombinant vectors are vectors functioning in filamentous fungi.

28. (Withdrawn) A method for producing a dimeric protein neoculin comprising:
- (i) a polypeptide NAS shown below in (A) or (B):
 - (A) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.2 in the sequence listing;
 - (B) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.2 in the sequence listing, which polypeptide can form the neoculin dimer having a taste-modifying activity together with a polypeptide NBS shown below in (a) or (b):
 - (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;
 - (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin; and
 - (ii) a polypeptide NBS shown below in (a) or (b), and having a taste-modifying activity:
 - (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;
 - (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid

sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin,

including a step of culturing a transformant according to claim 27.

29. (Withdrawn) A transformant carrying a first recombinant vector according to claim 11 and a second recombinant vector carrying a nucleotide sequence constituting the DNA of the gene encoding a polypeptide NBS shown below in (a) or (b):

- (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;
- (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin,

wherein the first and second recombinant vectors are vectors functioning in koji molds.

30. (Withdrawn) A method for producing a dimeric protein neoculin comprising:

- (i) a polypeptide NAS shown below in (A) or (B):
 - (A) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.2 in the sequence listing;
 - (B) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.2 in the sequence listing, which polypeptide can

form the neoculin dimer having a taste-modifying activity together with a polypeptide NBS shown below in (a) or (b):

- (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;
- (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin; and

(ii) a polypeptide NBS shown below in (a) or (b), and having a taste-modifying activity:

- (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;
- (b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin,

including a step of culturing a transformant according to claim 29.

31. (Withdrawn) A transformant carrying first recombinant vector according to claim 22 and a second recombinant vector carrying a nucleotide sequence constituting the DNA of the gene encoding a polypeptide NBS shown below in (a) or (b):

- (a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;

(b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.

32. (Withdrawn) A transformant carrying a first recombinant vector according to claim 23 and a second recombinant vector carrying a nucleotide sequence constituting the DNA of the gene encoding a polypeptide NBS shown below in (a) or (b):

(a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;

(b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.

33. (Withdrawn) A transformant carrying a first recombinant vector according to claim 24 and a second recombinant vector carrying a nucleotide sequence constituting the DNA of the gene encoding a polypeptide NBS shown below in (a) or (b):

(a) a polypeptide comprising an amino acid sequence shown in SEQ ID NO.6 in the sequence listing;

(b) a polypeptide comprising an amino acid sequence with the substitution, deletion, insertion, addition or inversion of one or several amino acids in the amino acid

sequence shown in SEQ ID NO.6 in the sequence listing, which polypeptide can be a subunit constituting curculin.

34. (New) An isolated polypeptide NAS according to claim 1, which comprises the amino acid sequence shown in SEQ ID NO:2 in the sequence listing.

35. (New) An isolated polypeptide PNAS according to claim 5, which comprises the amino acid sequence shown in SEQ ID NO:3 in the sequence listing.